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ABSTRACT

Although the literature abounds with speculation about open education, there are few experimental studies designed to test its effects. This research compared an open education program with a traditional program at the middle school level. Subjects were randomly assigned to comparison groups. Dependent measures included a self-concept scale, a measure of creativity, locus of control, and five achievement measures. Pre-test intellective measures showed equivalence between groups and post-test analysis found only one difference (creativity) which favored open education. Implications for "fitting" open education goals to curriculum programming are discussed. (Author)

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EFFECT OF OPEN EDUCATION ON SELECTED COGNITIVE AND AFFECTIVE MEASURES[1]

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INTRODUCTION

The roles of the teacher and child, and the global goals of open education have been described by journalists (Featherstone, 1976a, 1967b) and by scholars (Barth, 1970; Rathbone, 1970; Silberman, 1970). Examination of this approach has begun to attract educational researchers (Bussis and Chittenden, 1970). There is, of course, a difference in approach between theorist and researcher. Philosophical rhetoric has begun to give way to evaluation of curricula and student performance in light of specified goals. In addition, there is increasingly more description of limited, concrete goals, and less attempt at all-inclusive definitions of the open education model.

Proponents of open education make various claims concerning the effectiveness of open techniques. Rarely, however, are advantages spoken of in terms of cognitive development; by contrast, the stress is often put on affective outcomes. Indeed, the charge is occasionally made that "traditional" American school programs are obsessed with intellectual growth at the expense of other important facets of child development. Critics such as Kohl (1969) and Holt (1964) have asserted that "traditional" classrooms do not simply display a posture of benign neglect of affective outcomes, but rather debilitate and stifle emotional and affective growth. From a different perspective, Silberman (1970) suggested that "education for docility" is rather commonplace among American "traditional" schools. Implications abound in the critical literature that, because of authoritarian atmospheres with restricted student choice, pupils may have depressed self concepts and be heavily dependent upon teacher direction. That is, not only are students coerced into behaving at the direction of the teacher, but also, as a consequence, feel worse about themselves. Thus, open education

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proponents might suggest that increased student responsibility for decision-making simultaneously increases a student's perception of himself as the controller of his environment, and helps him feel better about himself.

It would seem, then, that two variables whose growth would increase as a function of the open classroom are locus of control and self concept. Locus of control refers to a generalized belief that reinforcements are a function of one's own behavior (internal locus), or that reinforcements result from "other" sources, such as luck, fate, God, etc. It should be noted that a person's perception does not fall into an internal/external dichotomy, but rather somewhere along the complete internal/external continuum. Locus of control as a social learning theory construct (Rotter, 1966) is rarely, if ever, mentioned in the open education literature. Similar ideas, however, have been discussed, and an internalized locus of control can be seen as a logical aim of an open education program. In such a classroom, a student is encouraged to assume a more active role; to initiate, plan, and undertake projects independently; to participate in self-evaluation; and to make significant choices about his own style and pace of learning. In social learning theory, the student is environmentally reinforced for causing things to happen which affect him. Theoretically, the open education notion of increased student responsibility should help the student recognize his role in mastering the environment, and move his locus of control in an internal direction. It seems reasonable to assume, too, that with an enhanced belief in mastery of the environment, self concept should improve. In one of the few related studied, Bleier (1972) found that open education students were somewhat less "conforming" than traditional education students. He concluded that open education may help a student rely on his own hunches rather than depend upon external direction.

Improved self concept has been claimed to result from open education (Silberman, 1970), but is seldom documented. Ruedi and West (1973) found no differences in self concept between middle school youngsters in an open education program, and students in a traditional program. Although the results of the Bleier (1972) and Ruedi and West (1973) studies are somewhat muted by design problems, they serve as evidence that researchers are beginning to adapt their evaluative techniques to open education and finding it fertile ground for investigation.

Another objective of the present research deals with creativity. In an open classroom, creativity is presumed to be reinforced generously. Another way of viewing this is that fluency and originality of response are valued and rewarded. Clearly, the open and traditional curricula are often contrasted in terms of their respective emphases on divergent and convergent production (Blitz, 1973). Yet, little empirical research supports the assumption that creativity improves as a function of the open classroom.

Self concept, locus of control, and creativity are not completely independent constructs. Individually and collectively they cannot be totally separated from scholastic achievement. The objectives of this study included an attempt to assess cognitive achievement, at least in a limited fashion. This objective reflects the fact that, while open education appears to stress affective development, it does not disregard the goal of cognitive accomplishment.

The specific objectives which directed this research were as follows: To investigate the effect of an open education program on

1. self concept, as measured by the Piers-Harris Self Concept Scale (1969);
2. locus of control, as measured by the Nowicki-Strickland scale (1972);
3. creativity, when creativity is defined as ideational fluency and is measured by Alternate Uses (Christensen, et al., 1960); and
4. cognitive development as measured by five subtests of the Stanford Achievement Test (Kelly, et al., 1964).

PROCEDURES

Subjects of this research were 145 middle school students in a rural/suburban New England setting. The school system is predominantly white, and the socioeconomic status is considered middle class. The middle school used in this study is a "two-program" school, and the options available to students are to enroll either in the "regular" (traditional) program, or in the open education program. Two comparison groups of students were identified. Both groups were comprised of students who, with parental approval, requested admission to the open education program. Because of enrollment limitations, all volunteers could not be accomodated, and students were randomly assigned to either the open education program, or a "waiting list" while still attending the "regular" program. Eighty students were selected from the

open education program in a stratified random fashion (20 Ss each from grades five, six, seven, and eight). The comparison group ("regular" program) consisted of 65 students, with approximately equal numbers at each grade level.

The "treatment" was a full school year in the open education program. This program is characterized by the following attributes: non-graded; multi-aged; learning activities organized around resource centers; student responsibility for scheduling math, science, social studies, language arts, and reading; regular use of variable instructional techniques, including multi-classroom groups, small discussion groups, and individual activities; and the use of daily student logs for scheduling, self-evaluation, and program evaluation.

Although there was random assignment of students to the alternate program and "waiting list", subject attrition and missing data threatened to remove the initial equality of the groups. Thus, these two groups were first compared on several pretest measures to determine whether group differences would dictate the use of covariance techniques. Pretest comparisons were done on IQ scores and on five subtests of the Stanford Achievement Test. With a single exception, the alternate and "waiting list" groups were found to be equivalent. A pretest difference was found on the Stanford subtest of Paragraph Meaning (a measure of reading comprehension). Thus, to control for any possible effects of this initial difference, one way analysis of covariance procedures were used on the dependent measures, with the covariate being the pretest score on Paragraph Meaning.

The dependent measures used to compare the open education and "waiting list" students were the Nowicki-Strickland Personal Reaction Survey (locus of control scale for children, 1972); the Piers-Harris Self-Concept Scale (1969); Alternate Uses (Christensen, et al.,1960), designed to tap the divergent production of semantic systems component of Guilford's Structure of Intellect model; and the following five subtests of the Stanford Achievement Test: paragraph meaning, arithmetic comprehension, arithmetic concepts, arithmetic application, and science.

RESULTS

The results of the analyses of covariance are summarized in Table 1. It can be seen that, on seven of the eight dependent measures, no differences were found. Only on Alternate Uses, a partial measure of creativity, did a

difference emerge; this difference favored the open education program. It appears that, over this limited amount of time (nine months), the traditional and open education programs contributed equally in the development of self concept, locus of control, and the several cognitive areas.

DISCUSSION AND CONCLUSIONS

The results of this study suggest that predicted results of an educational model do not occur automatically. Specifically, the implementation of an open education does not necessarily produce greater self concept or a more internalized locus of control. This finding leaves us with several alternative conclusions:

1. Open education is a hoax, because different processes do not apparently produce different results.
2. The results of this study have only limited generalizability because of sample and treatment idiosyncrasies.
3. Because affective growth is slow, a nine-month period in an open classroom situation was not sufficient to show actual long-term change.
4. Some important differences were not found because they were not studied.
5. Educational outcomes must be clearly defined and programs must be built to effect those outcomes, regardless of the philosophical framework of the school system or community.

While alternative #5 may seem especially pragmatic, it does not necessarily ignore the underlying philosophies of teachers or administrators. There is no question that the philosophies should help determine the goals of the program, and the program materials and methods should be consistent with the philosophical framework. But we need to stop pretending that a philosophy or value system will, by itself, produce all the positive outcomes hoped for.

The use of behavior modification techniques may be anathema to many open educators, but the general behavior modification model provides a mechanism for meeting school goals, regardless of philosophical orientation. A superficial view of behavior modification may lead one to believe that the methodologies involved are unethical and immoral because they "control" people. Rebuttals to this viewpoint are plentiful and persuasive (cf. Mahoney and Thoreson, 1972; Bandura, 1969, pp. 234-242). A recent movement among some operant psychologists has been an attempt to fuse two "opposing" ideologies into a single system: "humanistic behaviorism" (Meacham and Wiesen, 1974, p. ix). Despite limited empirical evidence, it seems possible

that behavior modification techniques are not incompatible with the open classroom model. Proctor and Smith (1974) have documented the successful use of behavioral objectives in an open classroom setting. Fawkey and Jones (in press) used a contingency management scheme in a kindergarten open classroom. They found greatly increased student choice of "academically" oriented learning centers when choices were systematically reinforced with teacher praise and encouragement. Similarly, Ascare and Axelrod (1973) showed the efficacy of behavioral techniques in enhancing academic productivity of fifth- and sixth-graders in open classrooms.

In a "humanistic behaviorism" system, the purposes of the school (viz., self direction) are accomplished by behavioral, contingency management techniques. Thus, "improved self concept" is defined in terms of behavioral attributes; attributes are targeted (say, with the use of behavioral objectives); and behavior is shaped toward the now concrete and operationalized goal. The shaping process may take a number of different forms, including group or individual contingency programs, contingency contracting, token economies, or a plethora of other situation-specific techniques. The point here is two-fold:

1. If we want to reach objectives, then we have to be as precise as possible in defining those objectives.
2. If we want effective movement toward concrete objectives, then school personnel might benefit from (inservice and preservice) study of simple behavior modification techniques. Also, practice, experimentation, and refinement of these skills would seem important.

A possible limitation of the present research must be noted. The use of traditional, standardized measures, especially achievement tests, in evaluating the effectiveness of open education is a questionable procedure. As Chittenden and Bussis (1971) have suggested, the process of problem solving is as important as the product of problem solving. Typical achievement tests present a fairly restricted set of stimulus materials, and scores depend upon "correct answers," not upon how the answers were found. It seems likely that because of open education's emphases on flexibility and individualization of thinking, these students may display an untapped richness of problem solving approaches. Still, "process" type assessment devices are in a rudimentary stage, and efforts must be redoubled toward bringing these instruments out of the "research edition" phase. Thus, implications for future assessment of open education include

the use of process, as well as product measures. Also, "sleeper" effects, which may take several years of consolidation before becoming apparent, make longitudinal research imperative. The research described in this paper is currently being extended into its second year, with relatively more emphasis on possible long-term and side effects of open education. For example, "school morale" and cognitive style are being studied, in addition to straightforward cognitive achievement and a wider array of creativity measures.

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Table 1

Summary of Analyses of Covariance for Eight Dependent Measures[1]

Dependent Variable	Open Ss treat. $\bar{X}$	Open Ss adjusted $\bar{X}$	Regular Ss treat. $\bar{X}$	Regular Ss adjusted $\bar{X}$	F	p
Alternate Uses	18.85	18.31	14.12	14.80	7.44	<.01
Piers-Harris	60.78	60.65	58.50	58.65	0.82	>.05
Nowicki-Strickland	6.49	6.65	6.54	6.34	0.25	>.05
Arith. Concepts[2]	18.16	17.09	18.37	19.59	3.47	>.05
Arith. Comprehension[2]	15.34	14.54	15.06	15.98	1.04	>.05
Arith. Application[2]	19.49	18.45	19.90	21.09	3.15	>.05
Paragraph Meaning[2]	38.35	36.14	37.38	39.90	3.58	>.05
Science[2]	36.30	35.05	36.59	38.09	3.43	>.05

[1]Covariate is pretest score on Paragraph Meaning subtest of the Stanford Achievement Test.

[2]Subtest of Stanford Achievement Test.